

Claims

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1. High-temperature resistant component (1) of a gas turbine that can be exposed to a hot aggressive gas with a metallic basic body (2) having a bond coat (3) and a ceramic barrier coating (4) applied thereto, whereby the bond coat (3) is disposed between the basic body (2) and the ceramic thermal barrier coating (4), and whereby the ceramic thermal barrier coating (4) comprises an inner coating region facing the bond coat (3) and an outer coating region facing away from the bond coat (3), whereby the inner coating region has a spinel of the structural formula AB_2X_4 and/or $B(AB)_2X_4$, and where

- X represents an element or several elements of the group comprising oxygen, sulfur, selenium and tellurium,
- A represents an element or several elements of the group comprising aluminum, manganese, iron, cobalt, nickel, copper, zinc, cadmium, silicon, titanium and tungsten, and
- B represents an element or several elements of the group comprising aluminum, magnesium, manganese, iron, vanadium, chromium, gallium, silicon, titanium, sodium and potassium.

2. Component (1) as claimed in Claim 1, characterized in that B represents aluminum (aluminate spinel) or chromium (chromium spinel), A represents nickel, cobalt or titanium, and X represents oxygen.

3. Component (1) as claimed in Claim 1, characterized in that B represents magnesium, A titanium, and X represents oxygen.

4. High-temperature resistant component (1) of a gas turbine that can be exposed to a hot aggressive gas with a metallic basic body (2) having a bond coat (3) and a ceramic barrier coating (4) applied thereto, whereby the bond coat (3) is disposed between the basic body (2) and the ceramic thermal barrier coating (4), and whereby the ceramic thermal

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~~barrier coating (4) comprises an inner coating region facing the bond coat (3) and an outer coating region facing away from the bond coat (3), whereby the inner coating region has a spinel of the structural formula AB_2X_4 and/or $B(AB)_2X_4$, characterized in that B represents aluminum (aluminate spinel) or chromium, (chromium spinel), A represents magnesium, and X represents oxygen.~~

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5. Component (1) as claimed in one of the preceding claims, characterized in that the spinel is present as a mixture in the ternary system of the type AB_2X_4 - AX - B_2X_3 .

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6. Component (1) as claimed in one of the preceding claims, characterized in that the mixed oxide system with the spinel has an additional oxide or several additional oxides.

7. Component (1) as claimed in one of the preceding claims, characterized in that the additional oxide is stabilized with yttrium oxide (Y_2O_3) or another rare earth oxide.

8. ~~Component (1) as claimed in one of the preceding claims, characterized in that between basic body (2) and thermal barrier coating (4) a bond coat (3) forming a bonding oxide is disposed.~~

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9. Component (1) as claimed in Claim 8, characterized in that the bond coat (3) is an alloy comprising at least one of the elements of the spinel.

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~~10. Component (1) as claimed in one of the preceding claims, characterized in that it is designed as a turbine moving blade, a turbine stationary blade or a heat shield of a combustion chamber.~~

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11. ~~Component (1) as claimed in one of the preceding claims,~~
characterized in that the thermal expansion coefficient α of the spinel is between $6 \cdot 10^{-6}/K$ and $17 \cdot 10^{-6}/K$.

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12. ~~Component (1) as claimed in one of the preceding claims,~~
characterized in that the thermal conductivity of the spinel is between 1.0 W/mK and 4.0 W/mK.

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13. ~~Component (1) as claimed in one of the preceding claims, wherein the metallic basic body (4) has a nickel-, cobalt- and/or chromium-based super alloy.~~

14. Process for producing a thermal barrier coating (4) on a component (1) of a gas turbine with a metallic basic body that has a bond coat (3) applied thereto, wherein a spinel of the structural formula AB_2X_4 and/or $B(AB)_2X_4$, where

- X represents an element or several elements of the group comprising oxygen, sulfur, selenium and tellurium,
- A represents an element or several elements of the group comprising aluminum, manganese, iron, cobalt, nickel, copper, zinc, cadmium, silicon, titanium and tungsten, and
- B represents an element or several elements of the group comprising aluminum, magnesium, manganese, iron, vanadium, chromium, gallium, silicon, titanium, sodium and potassium, is applied to the component (1) by plasma spraying or by vapor deposition.

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